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The efficiency of behavior modification technology, as a therapeutic intervention process, has been amply demonstrated. The establishment of special educational settings for modification of deviant behavior, as reported here, provides opportunity for a controlled analysis of the effects of groups of experimental variables, where treatment in regular classrooms is less amenable to the analysis of cause and effect relationships. This paper describes the development and evaluation of a treatment model designed for one class of deviant behavior: hyperactive, disruptive, acting-out behavior in the classroom. Some 12 males, in grades four, five, and six, average or above in intellectual ability, were the subjects. Socially acceptable behavior was reinforced by the accumulation of individual and group points exchangeable for free time for high valence activities. A variety of timing and recording devices were used to monitor behavior and points. Observations were made of subjects' behavior in special and regular classrooms. The treatment model proved very effective. Of three components, (1) token reinforcement, (2) social reinforcement, and (3) aversive controls, social reinforcement exercised the greatest control. (BP)

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Section One

INTERIM REPORT

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Special Class Placement as a Treatment Alternative for Deviant Behavior in Children

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Special Class Placement As A Treatment Alternative For Deviant Behavior in Children

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The efficiency and the efficacy of behavior modification technology, as a therapeutic intervention process, has been amply demonstrated within the last decade. However, the functional relationships which exist between treatment and behavioral variables in behavior modification technology have been most clearly validated through individual applications of learning theory principles (Patterson, 1965b; Patterson, McNeal, Hawkins, and Phelps, 1967; Wolf, Risley, and Mees, 1964; Williams, 1959; Hart, Allen, Buell, Harris and Wolf, 1964; Bentler, 1962; Lang, 1965; Baer, 1962).

The precise functional relationships between independent and dependent variables have been carefully specified in these studies. This control makes it possible to predict which treatment variables are accounting for the changes in behavior. It has been much more difficult to establish such precise cause and effect relationships in group applications of learning theory principles (Kounin, Frisen, and Norton, 1966; Rabinovich, 1959; Shannon, 1961; Haring and Whelan, 1962; Zimmerman and Zimmerman, 1962; Girardeau and Spradlin, 1964; Birnbrauer and Lawler, 1964; Quay, Wherry, McQueen, and Sprague, 1966; Hewett,

1966; Pimm and McClure, 1967; O'Leary and Becker, 1967; Valett, 1967; Mattson and Walker, 1967). The above group applications of behavior technology have demonstrated stimulus control of classroom behavior and have effected impressive changes in behavior within brief periods of time. However, these studies have not established precise cause and effect relationships between treatment and behavioral variables. In these studies a treatment procedure, including such components as token reinforcement, aversive controls, academic consequences, response cost, social reinforcement, extinction, and time-out from a reinforcing climate, has been applied to the academic and social behaviors of a group of subjects. The interaction of these variables becomes very complex in the process of intervention. With a large number of independent variables operating concurrently and with a large number of dependent variables being used to evaluate treatment outcomes, it becomes very difficult to determine which independent variables are accounting for differential amounts of behavior change in which dependent variables.

In group applications of learning theory, especially in classroom settings, it has been assumed that modifications in behavior are due to the manipulation of a group of treatment variables such as reinforcement schedules, antecedent events, academic consequences and so forth. However, there is little empirical data which clearly validates this assumption. The

modified behavior could be due to variables specific to the treatment setting such as increased teacher attention, novel educational materials, or an altered peer structure rather than to the manipulation of specifiable treatment variables. Such behavior change could also be attributable to coincidental alterations in the subjects' non-school environment.

There is also very little data on the differential effects or weight of treatment variables such as token reinforcement, aversive control, and social reinforcement in producing behavior change within the context of the classroom setting. It is possible that only one of these variables, rather than all three, is accounting for the changed behavior. It is also possible that some combination of variables is crucial to the behavior change rather than the independent operation of two, three, or more treatment components. It is important that group applications of behavior technology be carefully evaluated so precise functional relationships <u>can</u> be established between treatment and behavioral variables. Such a procedure would provide for a careful analysis of the treatment process and for a more efficient use of treatment components.

The decision to attempt modification of deviant behavior within special educational settings as opposed to regular educational settings should be weighed carefully in placement decisions. The population of special classes should consist of children whose academic and social behaviors cannot be feasibly

or effectively modified within the regular classroom setting. Such a population would include subjects with extremely high rates of deviant behavior and/or subjects with severe deficits in their academic skill repertoires. Frequently these classes are composed of children with multiple problems of mild severity which could be better treated in the regular classroom. The placement of children into a special treatment setting who display some form of homogeneity along the dimension of deviant behavior has a certain amount of administrative appeal. It removes an aversive stimulus (deviant behavior) from the teacher's presence; it insulates the problem behavior and localizes the process of treatment; and it does not require that the teacher or peer group be involved in the intervention. At the same time, such placement disrupts the integration of the behaviorally disordered child with his normal peers; it complicates the task of programing maintenance and persistence of treatment effects; and it mitigates against the use of the child's regular classroom peers in the control, shaping, and subsequent modification of his deviant behavior(s).

Another issue which confronts educational programing for deviant children is one of economics, and the related problem of efficiency. Quay, Wherry, McQueen, and Sprague (1966) allude to this problem in discussing remediation of the conduct problem child within the special class setting.

> "The economics of public schools obviously require the development of techniques that will allow children to be handled in a group situation by as few adults as possible ....techniques of behavior remediation are nevertheless likely to remain economically unfeasible, unless they can be adapted for use in a group setting such as the classroom."

Experimental classrooms for disturbed children are often operated by a team of highly paid albeit highly qualified individuals. Since the size of such classes is normally limited to between eight and fifteen subjects, the cost of treatment as the ratio between professional time involved and the magnitude of behavior change per S, even if it is markedly effective, is likely to be prohibitive for the average school district. It seems incumbent upon behavior technologists to construct both efficient and effective models of treatment which can be implemented by regular school personnel such as teachers, counselors, and school psychologists. Bandura and Walters (1963) argue that the primary task of the professionally trained clinician should be to develop effective therapeutic procedures based on social learning principles, to train available persons in the application of these principles and set up programs which these persons may implement under the clinician's guidance and direction. Thus, more people would receive more help than they do under current professional practice.

The ultimate goal of any special class for treatment of deviant behavior should be the reintroduction of its subjects into the regular classroom as soon as it is behaviorally possible. The work of Haughton (1968) and Patterson (1968) has demonstrated that many forms of deviant behavior can be modified effectively without removing the subject from the context of the regular classroom setting. Treatment administered within the regular classroom has the advantage of eliminating the problem of stimulus generalization from treatment to non-treatment setting while treatment administered within the office, clinic, or special classroom setting requires that the effects of such treatment generalize across both time and setting. When treatment is attempted within the special classroom, however, it is essential that stimulus conditions between the regular and special class settings be equated, that the social environment of the regular classroom be reprogramed so as to support the modified behavior of a deviant subject, and that stimulus generalization of treatment effects be programed rather than assumed.

This paper describes the development and evaluation of a treatment model which is designed to provide efficient modification of one class of deviant behavior: hyperactive, disruptive, acting-out behavior in the classroom.[1] The data presented here were generated by an inter-subject replication of the design, procedures, and results of the treatment model and by

an evaluation of the components of this model. Special attention is given to the persistence of treatment effects across time and across settings.[2] The goal of this research is the development of a workable treatment model, adapted to the school setting, which can be implemented by regular school personnel.

Method

Subjects

During the academic year 1967-68, twelve subjects were admitted to the experimental classroom. The subjects, all males in grades four, five, and six, were enrolled in two groups of six each. Selection criteria used average or above average intellectual abiliity, inadequate academic performance, and socially deviant behavior occurring within the regular classroom setting. All subjects possessed a number of behaviors which made them poor candidates for learning. Teacher defiance, distractibility, hyperactivity, and tantrum behavior were attributed to the group as a whole. Individual behaviors exhibited were physical and verbal abuse of peers, pre-delinquent behaviors (stealing, smoking, glue-sniffing) rejection of peer interaction, and excessive verbal outbursts (swearing, loud noises, smart talk). These behaviors were identified as most annoying to the regular classroom teacher; yet the subjects exhibited many additional behaviors illustrative of inadequate

social and academic adjustment. All candidates for the experimental classroom were screened by the Walker Behavior Checklist,[3] a behavior rating scale (Walker, 1968) and baseline observations of attending behavior taken within the regular classroom.

All subjects scored average or above on standardized intelligence tests (WISC; Stanford-Binet), but had educational deficits in the basic skill areas of from 4 months to 5.1 years (Gray's Oral Reading and Wide Range Achievement Tests). None of the subjects displayed any physical or sensory deficits as measured by standard auditory, visual, and general health tests. A more extensive neurologic examination suggested that one S had evidence of minor brain damage. Another S was on mild tranquilizers prescribed by the family physician for his hyperactive behavior. He had been on the drugs for approximately one year before entering the class and continued throughout the course of treatment.

Setting

The classroom facilities were adjoining and affiliated with a public elementary school in the Eugene School District. The primary area for academic activities contained six double desks (approximately 20" x 45" work surface), the teacher's desk and shelves and tables for the display of high interest materials. Adjoining rooms provided sink and table facilities for science and art projects, a carpentry room with a variety

of tools and wood, and the necessary observation facilities. Space was also available for individual testing, tutoring, and remedial instruction. A small isolation room (time-out) containing a chair and desk adjoined the classroom (Figure 1). The children used the same playground and lunch facilities as the regularly enrolled students in the school.

Insert Figure 1 About Here

Academic materials used in the classroom were designed to meet the instructional needs (individualized) of each child. Since the subjects were academically retarded in math, reading, language, and/or spelling, instructional attention was focused on these basic skill areas. Specific educational programing was based upon diagnostic tests administered during the first week the subjects were enrolled in the experimental classroom. Materials for use in the classroom included programed texts, books used in their regular classrooms, and teacher prepared materials. The programed materials used were based on evaluations of materials conducted during the previous academic year (Mattson, et. al., 1967). Programed materials used included: (a) Sullivan Associates Programmed Reading Series (McGraw Hill), (b) Classroom Reading Clinic (Webster Co.), (c) Geography of the U.S. (Programmed, McGraw & Williams), (d) Lessons in Self-Instruction in Basic Skills (California Test Bureau), and (e) T.M.I. Grolier Program (Teaching Machines, Inc.). The regular educational

and remedial materials used included: (a) Conquests in Reading (Kottmeyer & Ware, McGraw Hill), (b) Dr. Spello (Kottmeyer & Ware, McGraw Hill), (c) Science Research Associates, Reading Series and Math Series, and (d) Continental Press mimeographed materials. In addition, four of the subjects received individual instruction from a graduate assistant in the Hegge-Kirk & Kirk drills.

Apparatus

Individual sixty minute timers, placed on each child's desk, were used in a variety of ways to meet the specific behavioral needs of each child. The timers were particularly effective in controlling high rate distractibility. When a subject produced distractive behavior (attending to non-task stimuli), he was placed on a timer for a specified period of time. The instructions to the S were that he was not to look up from his task during that interval in order to receive points (reinforcers). The schedule was increased gradually from a time interval the subject could originally accommodate to a time-interval compatible with regular classroom requirements. This technique is based on the assumption that introducing a stimulus incompatible with distractions which functions as an S^D for a reinforcing event will lead to the response of academic production.

An electric, Universal interval timer with an eight-inch diameter face was used to record and control group attending

behavior. The hands of the sixty-minute timer were placed on a VI schedule of thirty minutes during academic activity. If the entire group was task-oriented during the time specified (using the same criteria as for individuals) they received a group point and the timer was re-set for another interval. If at any time during the interval, one or more of the children were not task-oriented, the timer hands were placed back on the starting point and not restarted until the deviant behavior was terminated. The group points were recorded on a large cardboard "thermometer" in the front of the room. As each point was earned the red marker was moved up an additional notch. When the marker reached the top, twenty-five points, the group was taken on a trip to an activity of their choice. The group reinforcing climate was particularly potent since it incorporated positive stimuli (trips) and aversive consequences (peer disapproval) into the same procedure.

The project staff designed an electronic display board for the purpose of recording reinforcing events and providing subjects with discriminative stimuli for appropriate and inappropriate behaviors. The device was also designed to provide a more systematic presentation and removal of points than can be provided by teacher marks on point sheets.

Insert Figure 2 About Here

The display board contains a unit for each subject with

name, stimulus light, three-digit plus and three-digit minus counters. A similar unit set apart from the rest and containing a larger light was used for recording and regulating the group reinforcing climate. A control panel on the teacher's desk allowed immediate and visible reinforcement. Each subject was required to be in his seat ready to begin the assignment before his light came on. When the stimulus light was on, it signified that the child was behaving appropriately and that he had gained access to a schedule of reinforcement. When a child received a point, his light flashed, there was an audible click, and the cumulative counter recorded the event. If the child was behaving inappropriately, his light was extinguished and a buzzer sounded which signalled the occurrence of deviant behavior. The subject had ten seconds in which to modify his behavior. If he did not modify his behavior within this time period, one point was subtracted for every five seconds that the deviant behavior persisted. If it became necessary for a child to be placed in the time-out room or to be suspended from the experimental classroom, his stimulus light remained off, as did the group light, until he returned to the classroom.

Reinforcing System

The reinforcing system within the experimental classroom was composed of both social and non-social reinforcers. Subjects were able to earn points for appropriate social and academic behaviors which could later be exchanged for such tangible,

back-up reinforcers as model cars, airplanes, games, books, paints, baseballs, and footballs. The advantage of using a large number of back-up reinforcers increases the probability that at least one of the stimuli would be relevant to the deprivation conditions of the various subjects (Ferster, 1962). These stimuli were grouped according to the number of points necessary to earn each item. The minimum interval of time necessary to earn the minimum stimulus (lowest point value) was approximately two days assuming the child was completely task-oriented during this period. Points were awarded on a combined interval-ratio basis.

Subjects also had the option of exchanging their points for free time which they could use to engage in a number of high strength activities such as building models, playing chess, working on science and art projects, or reading. (One point was equal to approximately one minute of free time.) The use of free time as a reinforcing alternative had several pragmatic advantages. It allowed each child to choose the free time activity that was most reinforcing for him. Free time, as a reinforcing event can easily be used in the regular classroom to strengthen weak academic and social behaviors. In addition, teachers appear to be more amenable to consequating good behavior with free time than with such contrived reinforcers as toys, trinkets, candy, etc. In addition, the special class use of reinforcing events available in the regular class should

facilitate the process of transition back to full-time, regular class placement.

Observation and Recording

Graduate students in education, interested in working with deviant children, served as observers throughout the various special and regular class phases. These independent observers used a time-sampling technique with behavior recorded at the end of each ten seconds during randomly selected ten minute intervals. Interval timers which emitted a soft "bleep" through an earphone were used to insure accurate time estimation and made it unnecessary to divert attention from the subject's behavior during recording.

Although several behavior categories were recorded simultaneously, the primary criterion was the proportion of time each child spent in appropriate, task-oriented behavior. These same observation categories were used: (a) in the regular class prior to enrollment in the experimental classroom to determine the level of functioning with the use of traditional educational procedure, (b) during experimental class treatment to assess behavior change, and (c) after the child was returned to the regular classroom to assess how well the modified behaviors maintained within that setting.

Insert Figure 3 About Here

In addition, during the time (2:00 to 3:30 p.m.) that the

subjects were in their regular classes each day while enrolled in the token economy, observers recorded their behavior as well as the behavior of the "normal" children in their classroom. From this data, comparisons can be made between; (a) the amount of task-oriented work of the deviant subjects and the classroom as a unit, and (b) the behavior of the deviant subjects in the regular classroom in relation to their concurrent behavior in the experimental class. During tenure in the special class, from two to three ten-minute observations were obtained for each child per day. The amount of time occupied by task-oriented behavior for a ten-minute observation (600 seconds) was determined by dividing the total seconds task-oriented by 600.

The observers were trained by using a video-tape recording of deviant classroom behaviors. The staff recorded simultaneous observations with the observer trainees until reliability between the sets of observation was .90 or above. The reliabilities were calculated by a per cent agreement method where number of agreements were divided by the total number of symbols. With the relatively small number of behavior categories (six) and with their precise definitions, it was possible to obtain very high (.90 and above) inter-observer reliabilities within a relatively short period of time. Checks on intra-observer reliability based on repeated viewings of the video-tape were very high. Once the observers were in the classroom setting

periodic checks were made to determine that inter-observer reliability remained at an acceptable level.

Procedure

Experimental Group I (Inter-subject replication). The purpose of this phase was to expose an equivalent group of subjects to the treatment model previously employed in order to validate its effectiveness in producing behavior change. A staging technique (Mattos, Mattson, Walker and Buckley, 1968) was used to introduce this group of subjects into the treatment setting. Two subjects were phased into the classroom at a time. The behavior of the admitted subjects was brought under manageable stimulus control before another group was introduced. This procedure allows for careful control of subject behaviors during the initial phases of treatment thus effecting a smoother adjustment to the treatment process. In addition, the first subjects were helpful in explaining classroom procedures to the new children. This facilitated acceptance of the program as well as providing a "review" for the initial group of subjects.

The children attended the special class from 9:15 a.m. to 1:45 p.m. At 1:45, the students were bussed to their regular schools to attend classes until 3:30 p.m. This procedure of returning the children to their regular classes served three major purposes: (a) it allowed the child to remain integrated with his regular classroom peers both socially and academically, (b)

it facilitated communication between the project staff and the regular classroom teacher, (c) it made possible the collection of data from the regular classroom so that the performance of subjects in the two settings could be directly compared and analyzed.

The contingencies and classroom procedures, operating within the treatment setting, were verbally specified to the subjects as they entered the special class. These rules specified consequences for both deviant and non-deviant behaviors. Figure 4 describes the stimulus consequences which were applied to the various classes of subject behavior.

Insert Figure 4 About Here

Individual points could be earned for appropriate academic behavior (task completion, correct answers on tasks, completion of specified units of academic work in relation to time) or for appropriate student behavior (raising hand, not talking, beginning work without talking, task attending). During the initial stages of treatment, subjects were reinforced for minor approximations to these appropriate behaviors on a nearly continuous basis. As treatment progressed and these behaviors came under control of the response-reinforcement conditions operating in the treatment setting, the frequency of reinforcement was reduced and the ratio between amount of academic production and amount of reinforcement was gradually changed

until the subjects were producing large amounts of work for small amounts of tangible reinforcement. Toward the end of treatment, the subjects' academic and social behavior was reinforced on a variable interval basis. Reducing the amount and frequency of reinforcement and shifting to a variable interval schedule near the end of treatment was designed to facilitate the generalization and persistence of treatment effects into the regular classroom setting.

Points could be exchanged at 1:00 p.m. each day for individual stimulus items. There were six levels of point value for the items, ranging from 25 points to 200 points with occasional special items for 500 points. The values for these reinforcers were selected to approximate their purchase price e.g. 25 points would be needed for toys costing 20¢ to 39¢; 50 points for toys costing 40¢ to 65¢; etc. The subjects were free to exchange their points for an inexpensive item or to accumulate them for a more expensive one. There was no evidence of an inability to delay gratification and save for higher prizes. Their academic production remained relatively constant whether receiving immediate exchange for toys or saving them.

Each child kept a bar graph recording on his desk of the number of points earned each day. If on any day he received more points than the previous day, he was awarded a bonus point. Points were awarded on the basis of concurrent schedules (Morse, 1966). Subjects could receive points on both

a variable interval ten-minute schedule of reinforcement (VI:10) for task-oriented behavior and a fixed ratio (FR:1) for completion of assignments. Social reinforcement in the form of attention, approval, praise, interest, and affection was paired with token reinforcement in order to transfer stimulus control from contrived reinforcers to those reinforcers more often available in the regular classroom and to build up responsiveness to social reinforcement through the process of generalization. Social reinforcement was also systematically applied in the regular classroom by specifying that the regular classroom teacher reinforce appropriate behavior a certain number of times per day.

The institution of group points was effective in making a highly desirable reinforcer (trips) available while simultaneously providing aversive control in the form of group peer pressure against individual deviant behavior. Deviant behavior in the classroom setting is sometimes reinforced by approval and recognition from peers (giggles, comments, gestures). A group reinforcing climate controls this source of reinforcement by making it more desirable to encourage peers to behave appropriately than inappropriately. Initially, all members of the group were required to produce appropriate social and academic behavior for an interval of five minutes in order to earn one point. The interval was gradually expanded until the subjects were working for as much as 45 minutes for one point. Group points

were earned on a VI:30 schedule during academic production. Thus, approximately five points could be earned daily; although even with a quiet, highly structured classroom, the subjects rarely earned more than two or three a day due to such minor infractions as daydreaming or distractions. It usually took two to four weeks to earn the points necessary for a group trip. These trips included slot car racing, pool, swimming, bowling, or museum trips.

The reinforcement procedures used in the treatment setting were supplemented by aversive consequences which were applied to certain classes of deviant behavior. Time-out from a reinforcing climate was used to consequate such behaviors as talking out, throwing objects, out-of-seat and inappropriate verbal behavior. Subjects were placed in time-out for a mimimum of ten minutes. During the time a subject is placed in the small, isolated room, he is unable to receive points, attend to the class, or work on an assignment. The group reinforcing climate is immediately terminated when a subject is placed in time-out and remains suspended until he re-enters the class. Time-out has proved especially effective in terminating deviant behaviors before they become disruptive (Tyler and Brown, 1967).

For highly disruptive behaviors such as fighting, leaving the building without permission, foul language and gestures, disobedience and/or defying the teacher, creating a disturbance

during time-out, or accumulating three time-outs in one day, the child was suspended from school for the remainder of that day or the following one, depending on the time in which the incident occurred. Readmission to the classroom was made contingent upon the subject's successful completion of all regularly assigned academic tasks at home. The alleged potency of this technique of course rests on the assumption that its application is aversive for the child. The "cost" to the child which derived from this consequence was usually quite high. It required that all regular academic assignments for the suspension period be completed successfully; all individual points were lost for the same period; the group reinforcing climate could not operate during this time, and parents were instructed to prohibit recreational activity and television viewing while the subject was absent from school. Suspension was normally used three or four times during the first few weeks of treatment and then rarely, if ever, used for the remaining two to two and one-half months of treatment. The technique appeared to be quite effective in suppressing such behaviors as teacher defiance, verbal abuse, fighting, and tantrum behavior.

In addition to the deviant behavior exhibited by most of the group members, some behaviors unique to any given subject were present which also proved amenable to reinforcement procudures and/or aversive controls. Points and peer reinforcement were used to strengthen behaviors incompatible with distractibility, and to

control such behaviors as crying, hyperactivity in seat, frontal lisp, and inappropriate verbal behavior. They were also used successfully to strengthen such behaviors as athletic coordination and positive, playground interaction.

Once the behaviors relative to the treatment goals for the experimental class had been altered and the observations in the regular classroom indicated that the child was functioning on a level at or above the class mean in task-oriented performance, arrangements were made to place the child back in his regular classroom. Before the child was returned to the classroom, points were given only once a day, assignments were made longer, the amount of group work was increased, teacher attention was reduced, and the rate of social reinforcement was increased. The climate of the special class was programmed to more nearly approximate that of an ordinary classroom. Before returning the child, the project staff members prepared an individual program, specific to the needs of a given child, for his teacher to follow. The program specified academic and social consequences for appropriate and inappropriate behavior so as to adapt the special class contingencies to the individual child in the regular classroom and to facilitate transfer and persistence of modified behavior across the two settings. A staging technique was again used to phase the subjects back into the regular classroom and to introduce untreated subjects into the special class.

Experimental Group II (Experimental evaluation of treatment model components)

The results of the initial application of the treatment model (Mattos, et. al., 1968) and the inter-subject replication data (see results section) indicate that this model is very effective in producing behavior change and in modifying deviant behavior. These data, however, do not provide information about which components of the treatment model are producing the behavior change. It is possible, for example, that only one or two variables are accounting for the major portion of variance in the treatment outcome(s). It is also conceivable that the behavior change depends upon the interaction of a series of these variables or even that such change is due to other than treatment variables such as stimuli specific to the treatment setting. (Teacher-student ratios, individual attention, teacher-skill, special materials, novel stimulation, etc.) The specification, control, and evaluation of all variables which could possibly affect treatment outcome in an applied setting would be practically impossible. However, it is possible to specify those variables which have been manipulated in the treatment process and which can be logically assumed to have a causal relationship to treatment outcome. A probe technique (Sidman, 1960) was used to evaluate the effects of five treatment model components upon the academic and social behavior of an additional group of subjects. This experiment

was designed to provide data on the influence or weight of a series of independent variables upon the dependent variable of attending behavior. The specific question to be investigated was the extent to which these variables controlled or accounted for variance in behavioral rates.

The components which were controlled and manipulated during the experiment were:

1. Individual Reinforcing Climate. Positive reinforcement for appropriate social and academic behaviors was administered on an individual basis in the form of points which could be exchanged for tangible, back-up reinforcers.

2. Group Reinforcing Climate. Subjects "cooperated" in securing group reinforcement by producing appropriate social and academic behaviors for given intervals of time. These group points were exchanged for special trips and activities.

3. Social Reinforcement. Social reinforcers in the form of interest, praise, attention, approval, and feedback, were consistently paired with the administration of points. As treatment progressed, these reinforcers were gradually substituted for points.

4. Time-out from a Reinforcing Climate. Deviant behaviors such as talking out of turn, throwing objects, unauthorized standing or walking, inappropriate verbal behavior and other, non-tolerated operants falling within this class of behaviors were consequated by immediate exclusion from the classroom

area for a minimum of ten minutes.

5. Suspension from a Reinforcing Climate. The following behaviors are consequated by immediate removal from the treatment setting: fighting, foul language, lewd gestures, tantrum behavior, defying teacher and leaving building without permission. If the S was suspended during the morning he was to remain home the remainder of the day; if suspension occurred in the afternoon he had to remain home the following day.

The design of the experiment required that stable baseline rates of behavior for all subjects be achieved before the effects of any one variable or combination of variables could be measured. The subjects were placed in the classroom with all treatment components operating. The controls were kept in operation until the suaject's behavior stabilized at values ranging from .80 to 1.00 (proportions, task-oriented behavior) across all academic activities after approximately three weeks of treatment. The experiment was divided into five phases. The schedule for manipulating treatment components was as follows:

Insert Table 1 About Here

The phases were altered without any explanation to the subjects. During Phase I, behavior was stablized with all controls in operation. During Phase II, all token reinforcement was abruptly withdrawn. Removal of the individual and group

reinforcing climates simply involved not administering points for appropriate social and academic behaviors. The display board remained off. The point record forms were removed from the subject's desks and the backup reinforcers (on display) were removed from the classroom area. When the effects of this withdrawal had been determined, the variables were replaced and the behavior returned to baseline levels during a re-instatement phase.

When the behavior had stablized, Phase III was introduced in which all social reinforcement was controlled in the classroom setting. Both positive (praise, gestures, physical contact, feedback, etc.) and negative (reprimands, glares, warnings, gestures, etc.) teacher-student interactions were considered under social reinforcement. The social component of the reinforcement was defined as non-tangible stimuli dispensed by a human agent in the process of interaction. In the process of implementing Phase III, the following instructions were given to the teacher:

1. No instructions will be given that anything is being changed. The children will <u>not</u> be told that social reinforcement is being changed or controlled.
2. No comments are to be placed on papers other than the number wrong.
3. No praise of any kind will be given.
4. Each child will be limited to five questions per day.

Approximately one minute of time will be allowed to answer each question. When 5 questions have been asked and answered, ignore any attempts by children to ask additional questions...Don't say "I can't answer" etc.

5. No physical contact such as gestures of approval, pats on the back, etc.
6. No warnings or reprimands
7. Time-out and suspension plus points will be used. However, if a child is not working, ignore him.

The teacher was continuously supervised by the project staff during the experiment to insure that such specific instructions were carried out.

In Phase IV, it was necessary to tell the subjects that they would no longer be suspended or placed in time-out for deviant behavior. This change in procedure was due to the low frequency at which it was necessary to use either control. It is conceivable, for example, that the subjects could have gone the entire two week period without exhibiting behavior deviant enough to warrant use of either control. When these controls were reinstated, they were simply placed into effect with no accompanying verbal instruction to the subjects. The final phase, Phase V, involved the permanent reinstatement of all treatment variables.

Results and Discussion

The data in Figure 5 provide a graphic record of the attending behaviors of subjects in Experimental Group 1 during both baseline and treatment conditions. These data successfully replicate the design, procedure, and results of the

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Insert Figure 5 About Here

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treatment model which was applied to the behavior of an initial group of subjects (all males) in grades four, five, and six during the academic year 1966-67 (Mattos, et. al., 1968). The primary difference(s) between the two applications of the treatment model were in the area of stimulus control. The behavior of subjects in the replication group came under more rapid stimulus control, maintained at a higher level of such control, and was less variable, during the treatment process, than the behavior of subjects in the initial group. It is assumed that a more efficient operation of the treatment model accounted for this result; however, it is conceivable that variability among the subjects in their responsiveness to the treatment process could explain the same phenomenon.

An inspection of the data in Figure 5 indicates that the attending behavior of all six subjects stabilized at very high rates during treatment. The baseline data show the characteristic patterns of variability of attending behavior in such natural settings as the regular classroom. However, when these

subjects were brought into a highly controlled, highly structured setting where the contingencies operating were verbally specified to them; their behavior was brought under almost immediate stimulus control. Verbally specifying contingencies and then implementing these same contingencies within a special setting appear to alter the acquisition rates of behaviors incompatible with non-attending behavior. In the usual treatment setting, acquisition rates gradually accelerate through adaptation and then become more stable as intervention progresses. However, the attending behavior of the above subjects is as stable and as controlled during adaptation as during any other point in the treatment process.

Insert Table 2 About Here

As can be seen from the data in Table 2, the treatment model was very effective in producing behavior change among the subjects in experimental group one. This group produced appropriate attending behavior an average of 39% of the time during the baseline phase and 90% of the time during treatment. The mean difference of 51% between the two conditions was statistically significant beyond the .001 level of confidence.

Insert Figure 6 About Here

All subjects were given the Wide Range Achievement Test and Gray's Oral Reading Test upon entry and just prior to exit

from the experimental classroom. A span of approximately 2.5 months separated the two samples of academic behavior. All subjects improved on either one or both tests. Subject 3 made the largest academic improvement (6.0-7.8 WRAT; 1.2-3.0 Gray's Oral) while subject 1 showed the least gain (1.0-1.0 WRAT; 5.5-6.4 Gray's Oral). Subject 2's loss of a month on the Gray's Oral Reading Test was attributed to testing error. The impressive academic gains of the subjects in basic skills area reflects an intensive emphasis upon reading, math, language, spelling, and vocabulary during the treatment period. It is expected that the improved academic and attending skills of these subjects will stimulate the operation of such natural reinforcers as task completion, academic success, and acquisition of new knowledge which will in turn reinforce and maintain subsequent attempts at successful academic behavior.

As mentioned earlier, all six subjects returned to their regular classrooms from 2:00 until 3:30 each day. Observation data were taken on their behavior during this period so their performance in the treatment and non-treatment settings could be compared and the amount of stimulus generalization which occurred between the two settings estimated.

Insert Figure 7 About Here

The data in Figure 7 describe the mean performance of each subject on the variable of attending behavior during

successive one week blocs. During bloc one, there is a fairly pronounced discrepancy between the performances of subjects in the experimental and regular classroom settings. During the second and third blocs, this discrepancy gradually decreases until by the fourth week of treatment, the behavior of all six subjects is indistinguishable within the two settings. As a group, the subjects' attending behavior followed a fairly typical acquisition pattern. However, discrepancy scores for individual subjects did not remain constant. In bloc one, for example, there was a pronounced discrepancy in performance (percent task-oriented behavior) for subjects one, two and three while there was very little discrepancy in performance for subjects four, five and six between the two settings. During bloc two, however, there were pronounced discrepancies for subjects four and five and minimal discrepancies for subjects two and three. In bloc three, although considerably smaller, the most pronounced discrepancies occurred for subjects two and three. Each mean score, in the regular classroom, represents a minimum of six, randomized observations per week while mean scores for experimental classroom performance represent a minimum of ten observations for each subject. It is thus possible, but unlikely, that the variability or shifts in the generalization data across subjects is due to observer bias, sampling error, or unreliable measures. It is more probable that the response-reinforcement contingencies operating in the experimental

class were differentially effective in controlling the behavior of subjects outside the treatment setting during the first three weeks of intervention. The behavior of subject six provides tenuous support for this hypothesis in that the discrepancy between his performance in the two settings was no greater than .08 during the first five weeks of treatment. It should be noted that no attempts were made to reprogram the regular classroom environment in order to facilitate stimulus transfer either before or during the period in which these data were recorded.

After determining that stimulus transfer of modified behaviors between the experimental and regular classrooms did occur during the treatment process; procedures were established for measuring the effects of generalization and maintenance after treatment in the special setting was terminated. Procedures were also established to determine how well a "treated" subject's behavior maintained in relation to the behavior of his peer group in the regular classroom.

Insert Figure 8 About Here

In Figure 8, each datum point on the dotted axis represents twenty minutes of randomized observation data taken on one of the subject's peers in the regular classroom. Each datum point on the solid axis represents ten minutes of randomized observation data taken on the "treated" subject in his regular

classroom following treatment. From these data, it was possible to compute ratios between a subject's treatment and post-treatment performance and between the subject's post-treatment behavior and the behavior of his peer group.

Insert Table 3 About Here

The first column in Table 3 expresses the ratio between the mean value of two hundred minutes of post-treatment observation in the regular classroom to the mean value of the same subject's performance on the variable of attending behavior during 2.5 months of treatment in the experimental classroom. If the ratio were 1.00, then there would be no quantitative difference between the subject's performance in the two settings. If the ratio exceeded 1.00, the subject's rate of attending behavior in the regular classroom would exceed his rate in the experimental classroom. If the ratio were less than 1.00, his rate of attending in the experimental class would be greater than his rate in the regular classroom. The second column in Table 3 describes the relationship between the mean value of a subject's post-treatment performance (200 minutes of observation data) and twenty minutes of randomized observation data on each one of his peers. If this ratio is 1.00, the subject's behavior is maintaining at the mean of his peer group on attending behavior. If the ratio is greater than 1.00, his behavior is maintaining above the class mean; if it

is less than 1.00, the subject's behavior is maintaining below the class mean.

Column one in Table 3 indicates that none of the subjects' post-treatment behavior maintained as high as their behavior during treatment. The ratio's range is from .39 to .97. Subject five was producing only thirty-nine percent as much appropriate attending behavior during the post-treatment period as during the treatment period whereas subject one was producing 97% as much attending behavior during this same period. The behavior of the group, as a whole, was maintaining at a value of .72 three months after the termination of treatment. Continued follow-up observations will allow the authors to measure the generalization of treatment effects at six, nine, and twelve month intervals.

Column two in Table 3 indicates that the behavior of two subjects was maintaining above the mean of their respective classes while the behavior of four subjects was maintaining below the mean of their classes. Inspection in Figure 8 reveals that subject one's class produced the largest amount of appropriate attending behavior while subject three's class produced the smallest amount during the observation period (one month). Subject three's behavior seemed to be under much better stimulus control than the majority of his classmates. Although only an assumption, the writers suspect that this subject's improved academic skills produced enough reinforcement (task completion, academic success, positive feedback) to

maintain his appropriate academic and social behaviors at a very high rate. The data in Figure 6 indicate that this subject made the greatest academic gains of all six subjects during the treatment period.

It was impossible to predict the persistence of treatment effects from the behavior of subjects during the course of intervention. Not more than five percentage points separated the mean performance of all subjects during treatment. It was equally difficult to predict the persistence of treatment effects from the behavior of the peer group in which the deviant subject was placed. The two subjects whose post-treatment behavior maintained most efficiently were members of peer groups which respectively produced the largest and smallest amounts of appropriate attending behavior during the period in which these data were taken. Specific programs, tailored to each individual subject's behavior, were written for the regular classroom teachers to follow in the task of maintaining modified behaviors. It is conceivable that teachers of subjects one, two and three implemented these programs more effectively than teachers of subjects four, five, and six. However, the authors have no data which would substantiate this hypothesis. A more plausible explanation lies in the respective academic skills of the experimental subjects. The behavior of subjects one, two, and three maintained most efficiently both in relation to their performance in the treatment setting and in relation

to the behavior of their respective peer groups. These same subjects were also the most academically skilled (grade level versus achievement level) of the group (Figure 6). Although these data by no means establish an absolute, covariant relationship between academic skill or achievement and persistence of treatment effects, they do suggest that academic success (positive feedback, task completion, acquisition of new knowledge) and the reinforcement which this success can produce (good grades, peer status, teacher approval) can be a potent factor in the maintenance of modified behavior following treatment in an experimental setting.

Insert Figure 9 About Here

The data in Figure 9 contain the results of an experiment which evaluated the components of token reinforcement, social reinforcement, and aversive controls in the control of behavior in a special class setting. The data in Phase I record the performance of the subjects with all controls operating. This phase lasted until the behavior of all subjects stabilized at high rates. During Phase II, all token reinforcement dispensed through both individual and group reinforcing climates, was withdrawn. This procedure had very little effect upon the attending behavior of subjects one, three, and four. It had an initially substantial impact on subject two's behavior and a very dramatic impact on the behavior of subject five.

However, the behavior of both subjects returned to the original level after several days and remained there until Phase II was terminated. Token reinforcement was reintroduced during an intervening reinstatement phase which was designed to return the behavior to its original, pre-intervention level of stability.

During Phase III, all social reinforcement was controlled within the classroom environment. The effects of the withdrawal of this component were not immediately reflected within the data; perhaps because it took the subjects some time to discover that the social reinforcement had, in fact, been withdrawn. The withdrawal produced a marked increase in the variability of the behavior of all subjects indicating that this variable exercised powerful control over the subjects' attending behavior. This phase was terminated at the end of two weeks when it became obvious that the subjects' behavior was not going to return to its original level or stability (as in Phase I) with this variable withdrawn. When social reinforcement was reinstated, the attending behavior of all subjects immediately returned to its original level of stability and remained there until the beginning of Phase IV where all aversive controls were withdrawn. The removal of time-out and suspension, as aversive controls, had differential effects upon the subjects' behavior. Subject three's attending behavior was apparently not under the control of these aversive stimuli. In fact,

his behavior during this period was slightly more stable than at any other time during the experiment. Though slightly less pronounced than the effect of removing social reinforcemtnt, the withdrawal of all aversive controls indicated that these components accounted for large amounts of variance in behavioral rates and were very effective in controlling the behavior of subjects in this experiment. The aversive controls were reinstated after a two week period and the experiment was terminated at this point. The remainder of the treatment period consisted of preparing the subjects for full-time entry into the regular classroom.

Insert Table 4 About Here

Table 4 contains the mean scores and standard deviations for the group of subjects during each experimental phase. Although slightly more variable following experimental intervention, the behavior of all subjects was very stable during phases I and V. . The group's attending behavior was most variable during Phase IV and lowest, in terms of mean score, during Phase III. This inter-subject variability, however, is very misleading when used to evaluate the effects of experimental intervention. The inter-subject variability in Phases II, III and IV is approximately the same; yet Figure 9 indicates that very differential effects were produced in the subjects'

intra-subject variability following withdrawal of the respective components. The withdrawal of token reinforcement had very little effect upon the subjects' behavior. The variance in the data was attributable to the behavior of only two subjects. The data in Phase III show the same inter-subject variability as those in Phase II; yet inspection of Figure 9 indicates that the intra-subject variability of these same data clearly establishes social reinforcement as the most potent component of the treatment model in controlling attending behavior.

Although conclusions based upon the data generated by this experiment must be regarded as tentative until an exact replication has been successfully completed, its results are nevertheless worthy of discussion and speculation. For example, the effects of withdrawing token reinforcement was rather unexpected. Token reinforcement was apparently exercising much weaker stimulus control over the social and academic behaviors of the subjects, at this point in the experiment, than the authors had estimated. If all token reinforcement had been withdrawn during the initial stages of treatment, the authors suspect that its effect upon the subjects' behavior would have been much more marked. The subjects' appropriate behavior was apparently under the control of such intrinsic reinforcers as academic success, social approval, individual attention, task mastery, and positive feedback by the time token reinforcement was removed.

The data appear to be in direct contrast to the evidence provided by Levin and Simmons (1962a) which suggests that adult praise did not exercise control over the behavior of fifteen emotionally disturbed males between the ages of 7.2 and 11.9. A second study, Levin and Simmons (1962b), which alternated food reinforcement and social reinforcement on successive trials, indicated that praise served as an aversive stimulus rather than a positive reinforcer for these subjects.

Although praise was not the only variable controlled in Phase III of the present study, expressions of positive and negative feedback, approval, attention, affection, and interest by the teacher were. These stimuli not only appeared to be non-aversive for these subjects; they were, in fact, highly reinforcing and functioned as very powerful controls of their appropriate social and academic behaviors. This result is consistent with the findings of other experimenters in the field who have used social reinforcement effectively in controlling both the social and academic behaviors of children, in the classroom, laboratory, and clinic setting (Allen, Hart, Buell, Harris, Wolf, 1964; Harris, Johnston, Kelley, Wolf, 1964; Harris, Wolf, Baer, 1964; Becker, Madsen, Arnold, Thomas, 1967; Hall and Broden, 1967; Hall, Lund, Jackson, 1968; Thomas, Becker, Armstrong, 1968).

Withdrawal from a reinforcing climate contingent upon the production of deviant or inappropriate behavior is a form

of punishment which was most effective in controlling and modifying this class of behavior. This technique not only decreases the probability that these deviant behaviors will occur (its withdrawal increased this probability during the experiment), it terminates disruptive, deviant behaviors very rapidly. As a result, the systematic application of time-out can function as a very powerful learning and control device in classroom settings provided that the climate of these classrooms is reinforcing.

This experiment provided only a gross evaluation of the treatment model's components. It should be carefully replicated before its results are generalized and applied to the response class of acting-out, disruptive behavior in children. In addition, such dichotomies as individual versus group reinforcing climates and time-out versus suspension may produce differential effects in the control and modification of behavior. The interaction between various combinations of these variables may also be a crucial factor in producing behavior change. Additional experiments will have to evaluate these interactions, before the functional relationships which exist between behavioral and treatment variables are clearly established and precisely described.

Summary

Two groups of experimental subjects were discussed. The

first group provided an inter-subject replication of the design, procedure, and results of an earlier application of a treatment model to the behavior of male subjects in grades four, five, and six. The model was very effective in producing changes in both attending behavior and academic proficiency. Follow-up data indicated that the behavior of the six subjects was maintaining at a 72% level of efficiency at three months after the termination of treatment. Three components of the treatment model: token reinforcement, social reinforcement, and aversive controls were evaluated in terms of their efficiency or potency in controlling the behavior of a second group of five subjects. The results indicated that social reinforcement exercised the greatest control over the subjects' behavior while aversive controls were slightly less effective in controlling the same behavior. Token reinforcement exercised surprisingly little control over the subjects' attending behavior.

Footnotes

1. This research was supported by U.S.O.E. Grant #OEG 4-6-061308-0571 Assessment and Treatment of Deviant Behavior. Bureau of Education for the Handicapped.

2. It is the authors' impression that very little systematic data has been reported in the literature on the maintenance and persistence of modified behavior following treatment in a token economy. Often, attempts at getting such data are limited to periodic phone calls to the school or verbal and written reports from school personnel as to how well a subject's post-treatment behavior is maintaining. Pilot data collected on two groups of subjects at three and six month intervals following treatment in a token economy during the academic year 1966-67 suggested that treatment gains on the variable of task-oriented behavior did not maintain when the subjects' were returned to their regular classrooms. At the start of the next school year, the project staff received requests from the school district to "do something" about the behavior of 5 out of the 11 subjects who had received treatment in the token economy the previous year. The behavior of all 11 subjects was under careful stimulus control prior to entry into their regular classrooms on a permanent basis. During the past year, the authors have been developing strategies for facilitating stimulus generalization of modified behavior(s) across time and settings. Initial

results of these efforts are reported here. A more systematic two year study of generalization effects will begin in the fall of 1968.

3. Copyright and publication by Western Psychological Services, Inc., Los Angeles, California.

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TABLE 1

Schedule of Manipulating Treatment Components - Group II

Control Variables	Phases I	II	III	IV	V
Individual token	X		X	X	X
Group token	X		X	X	X
Social	X	X		X	X
Time-out	X	X	X		X
Suspension	X	X	X		X

X = control variables operating

TABLE 2

Means, Standard Deviations, and N's
of Baseline and Treatment Scores with
Test for Statistical Significance

Baseline (N = 6)		Treatment (N = 6)		D	Critical Ratio
M	S.D.	M	S.D.		
39	5.19	90	1.49	51	10.73*

*Significant at .001 level

TABLE 3

Intra and Inter-Subject Comparisons
of Performance Following Treatment
in an Experimental Class

Intra-Subject Ratio Comparison of Treatment Performance Versus Post-Treatment Performance (Experimental versus Regular Class)		Inter-Subject Ratio Comparison of Treated Subjects' Performance with mean Performance of his Peers in the Regular Classroom	
Ratio	$\frac{\text{TM}}{\text{Post-TM}}$	Ratio	$\frac{\text{Reg. Class (Deviant S) M}}{\text{Reg. Class (Peer Group) M}}$
S_1	.97		1.02
S_2	.76		.90
S_3	.84		1.27
S_4	.67		.75
S_5	.39		.49
S_6	.72		.85

TABLE 4

Summary Data on the Effects
of Experimental Manipulation
in Phase I Through V (N = 6)

Phases	#I	#II		#III		#IV		#V	
M	S.D.	M	S.D.	M	S.D.	M	S.D.	M	S.D.
86	2.40	80	10.44	59	10.77	68	12.96	88	3.42

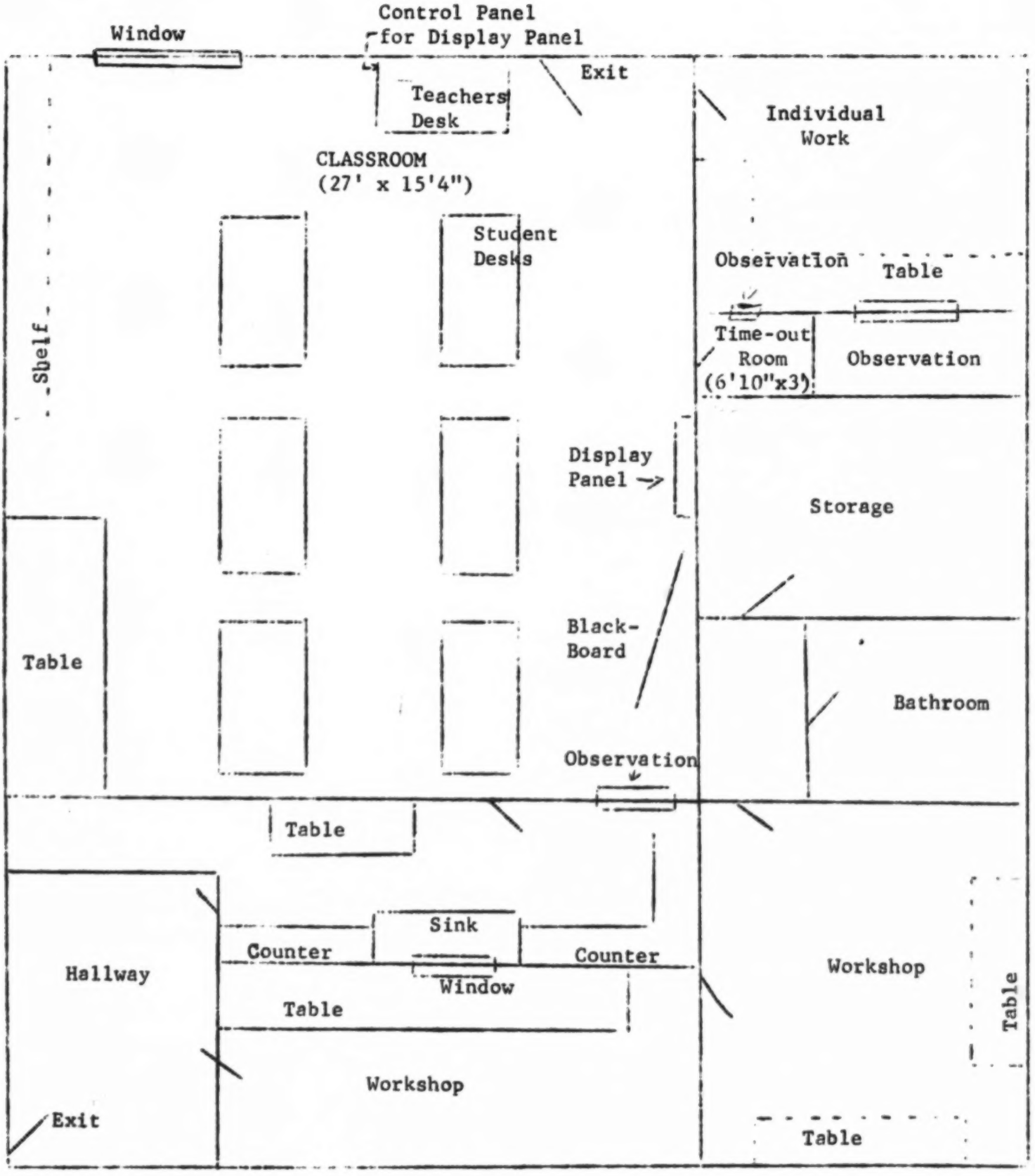
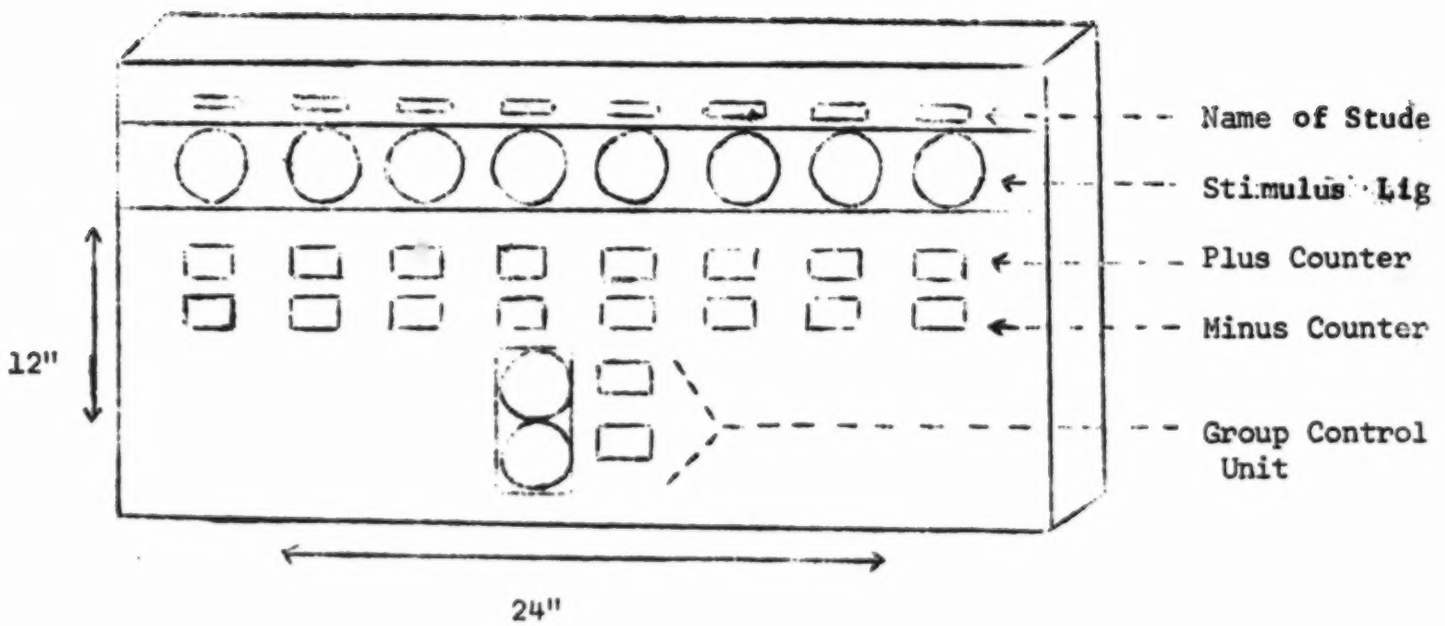


Figure 1

Schematic Diagram of Treatment Setting



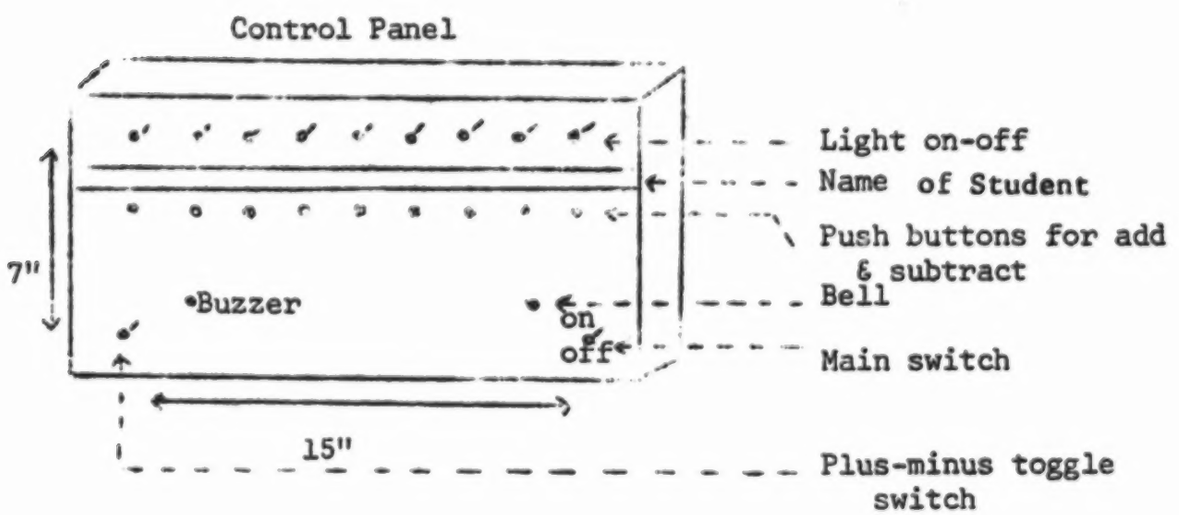


Figure 2

Electronic Display Board

Name_____Date_____Observer_____

Indiv._____

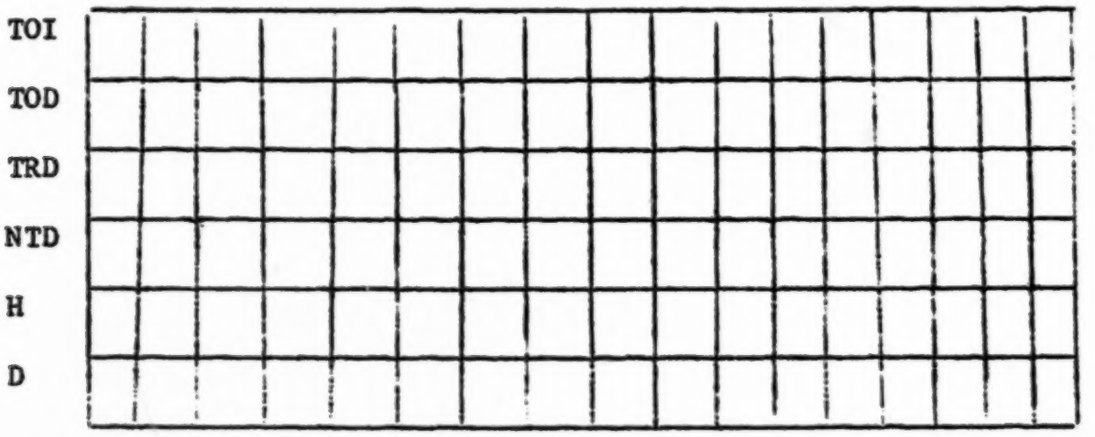
Activity_____Group_____Time_____To_____

Treatment Period

Baseline:_____ELP Class:_____Regular Class:_____Followup_____

Individual_____

Controls Operating:Group_____



TOI = TASK ORIENTED INDEPENDENT - Student completely involved in task independently of the teacher and is working on the task assigned to him by same.

TOD = TASK ORIENTED DEPENDENT - Teacher or teacher aid is directly assisting the student with the assigned task, includes repeating or further explaining directions.

TRD = TASK RELATED DEVIANCY - Inappropriate peer interaction and/or inappropriate classroom behavior in the course of doing or completing a task - talking to peers re: task, interrupting others in the course of completing a task (shouting out answers, etc.)

NTD = NON-TASK RELATED DEVIANCY - Behaviors disruptive of a learning climate fighting, talking, facial grimaces, nonverbal signals between peers, loud tapping of pencils, slaming books on desk, wandering around room, etc.

H = HAND - Seeking teacher assistance, sharpening pencils, going to lavatory, getting a drink.

D = DISTRACTION - (Non-task oriented; non-deviant) - Looking into space, looking around room, looking at someone entering the room, distracting to a specific noise or event, attending to a stimulus other than the education task (fiddling with a pencil, self-stimulation, playing with erasers, etc.)

Figure 3
Observation Form and Description of Behavioral Categories

I. Stimulus Consequences of Deviant Operants

A. Immediate removal from ELP building for the following behaviors -(If expelled during a.m. the S will stay out for the remainder of the day and return the following morning. If expelled during p.m. will remain home following day.)

1. Disobediance and/or defying teacher
2. Fighting
3. Leaving building without permission
4. Foul language, lewd gestures
5. Creating a disturbance during isolation period (time-out)

B. Immediate exclusion from the classroom area for 10 minutes (minimum) for the following operants: (S decides when he will return to classroom area.)

1. Talking out of turn
2. Unauthorized standing or walking
3. Talking or standing without raising hand and securing permission
4. Throwing objects
5. Other, non-tolerated operants falling within this class of behaviors

II. Reinforcement

A. Individual basis

1. Social: -raising hand
   -not talking
   -remaining in seat
   -beginning work without talking upon entering room.
2. Academic: -task-oriented
   -completion of tasks
   -correct answers on assignments

B. Group Basis

1. Clock timer will be set at preselected time intervals each day provided all S's are present in the classroom area and are engaged in task oriented behavior.
2. A group payoff will be instituted when the group accumulates a preselected number of points.

III. Behaviors to be ignored-

-asking for help without raising hand
-irrelevant questions
-tapping pencils (unless disturbing class)
-pouting and crying

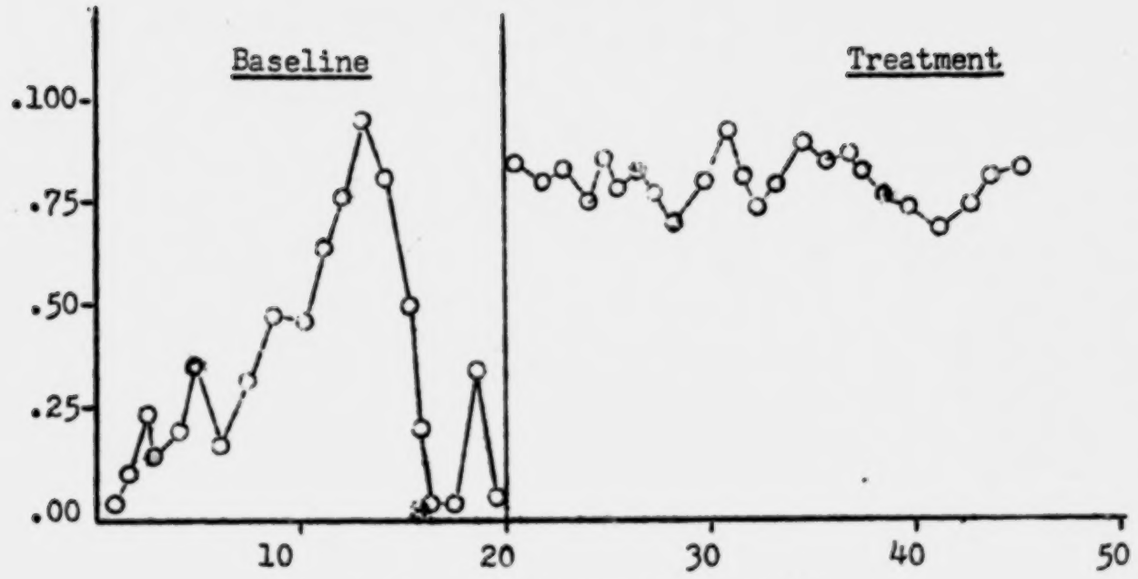
Figure 4
Program For Coping With Deviant Classroom Behaviors
ELP Experimental Class

Figure 5

Experimental Group 1

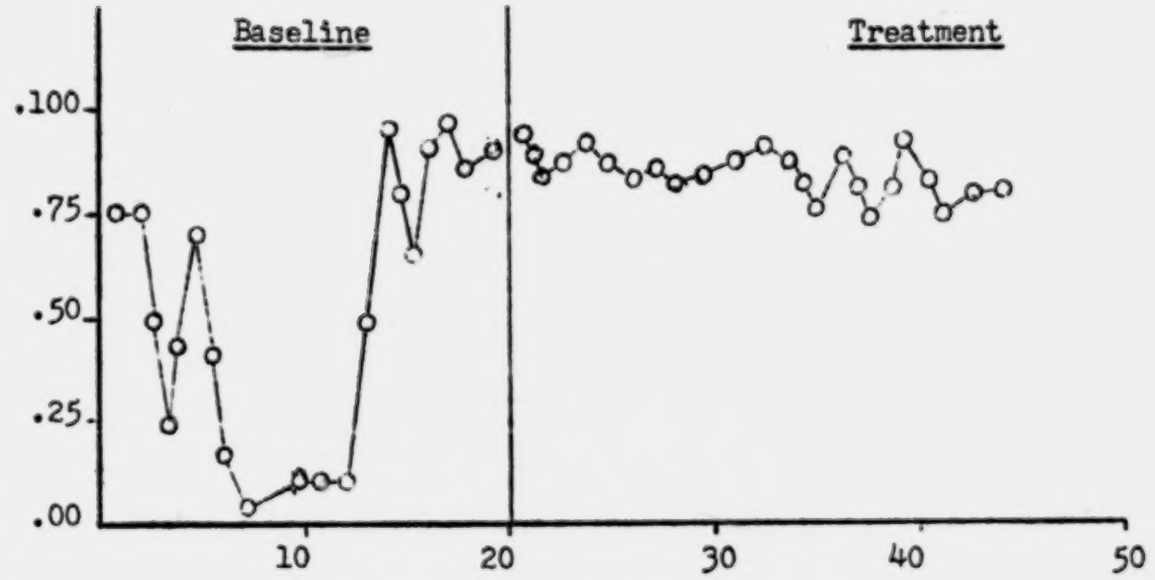
Proportions of Task-oriented Behavior for Six Disturbed Subjects During Baseline and Treatment Conditions

Subject 1



# of 10 min. Observavtion Sessions

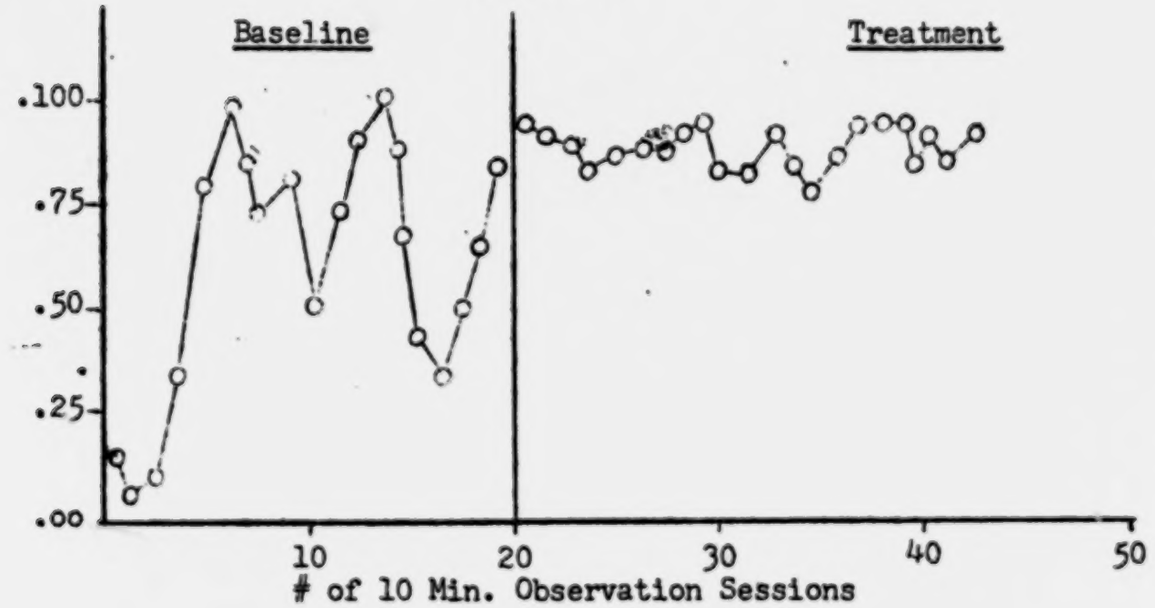
Subject 2



Proportion: Task-Oriented Behavior

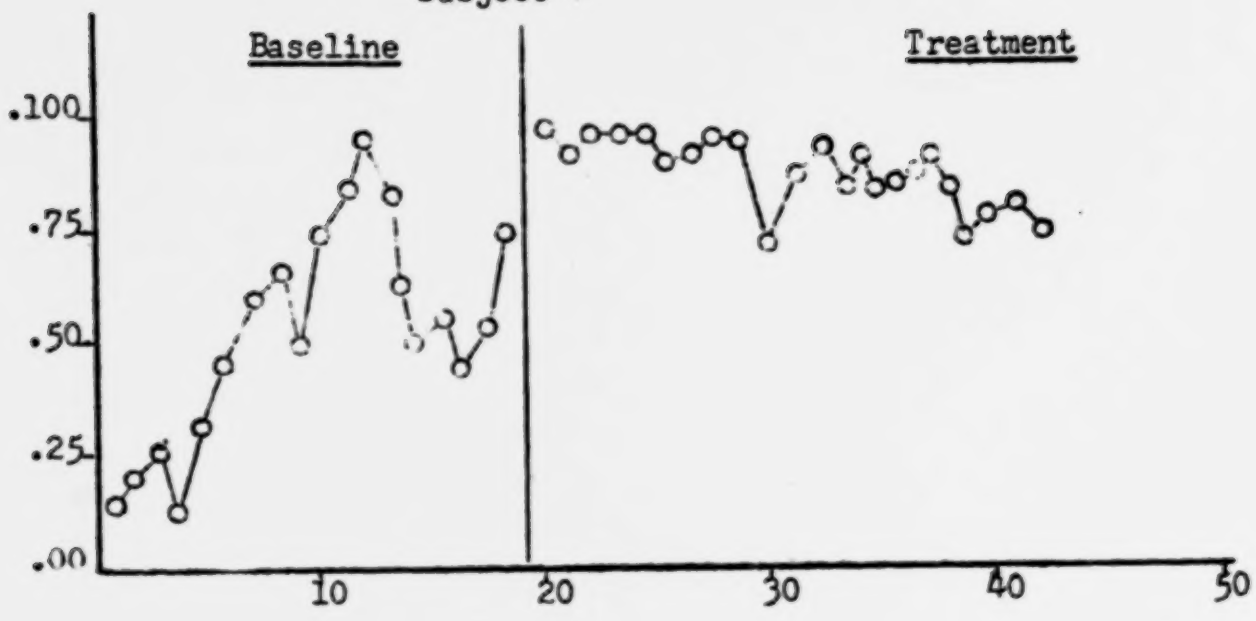
of 10 Min. Observation Sessions

Subject 3



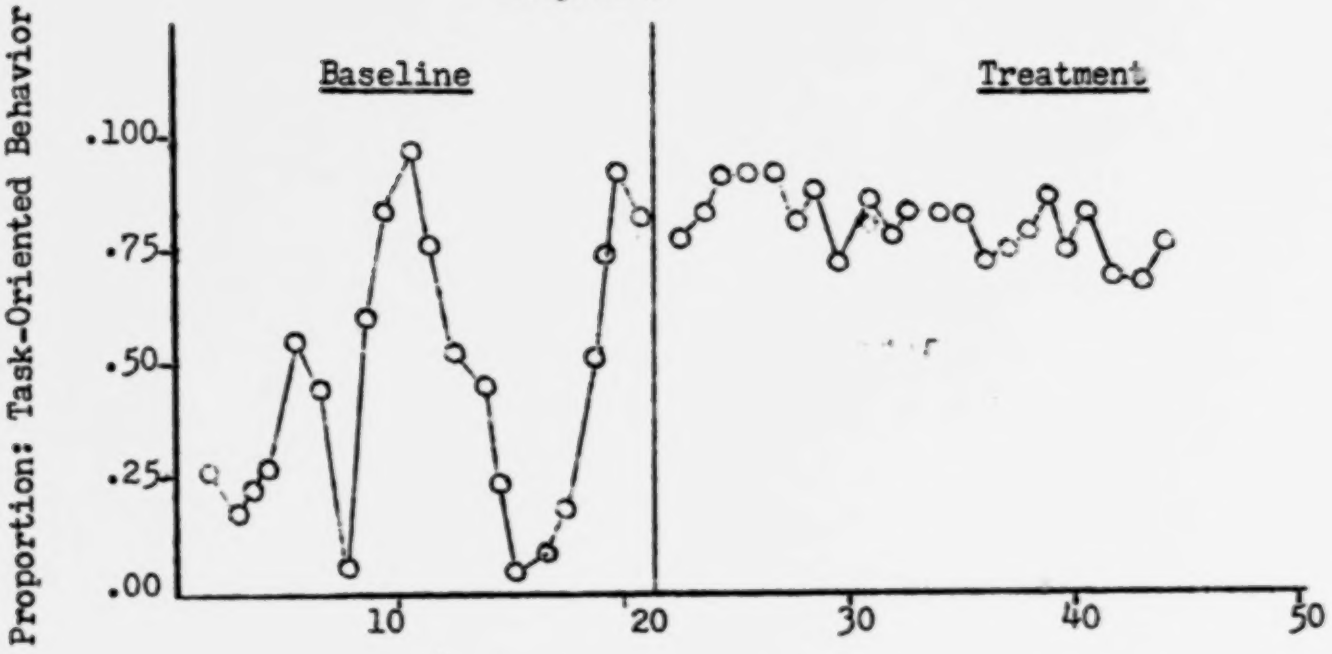
of 10 Min. Observation Sessions

Subject 4



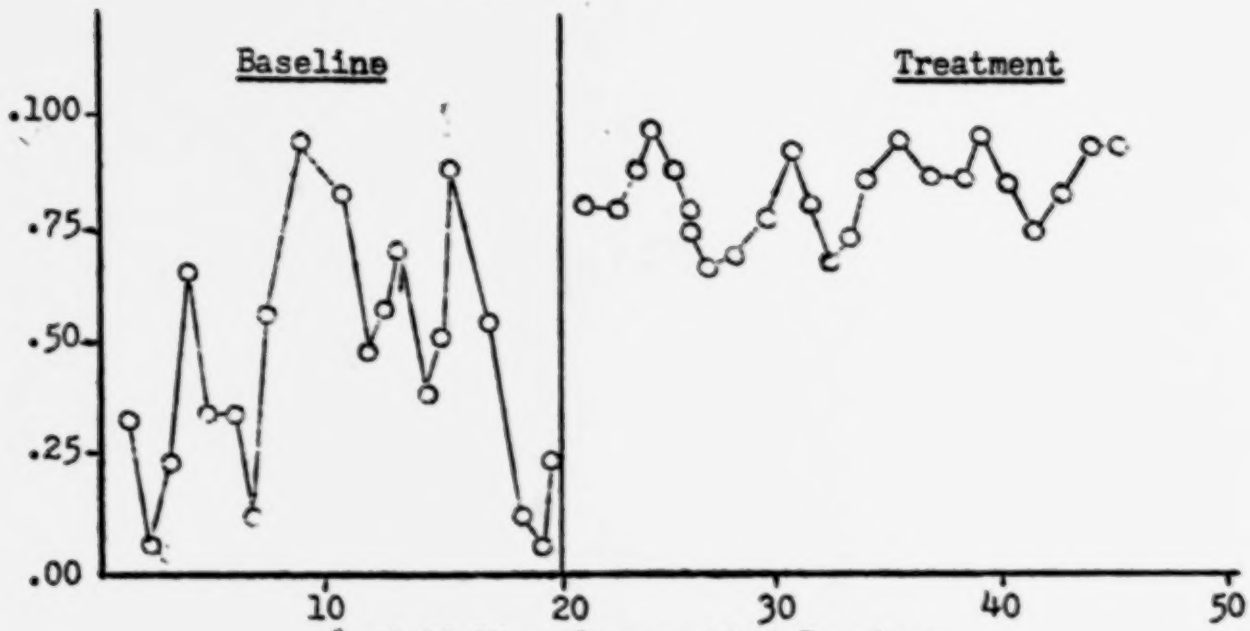
of 10 Min. Observation Sessions

Subject 5



of 10 Min. Observation Sessions

Subject 6



of 10 Min. Observation Sessions

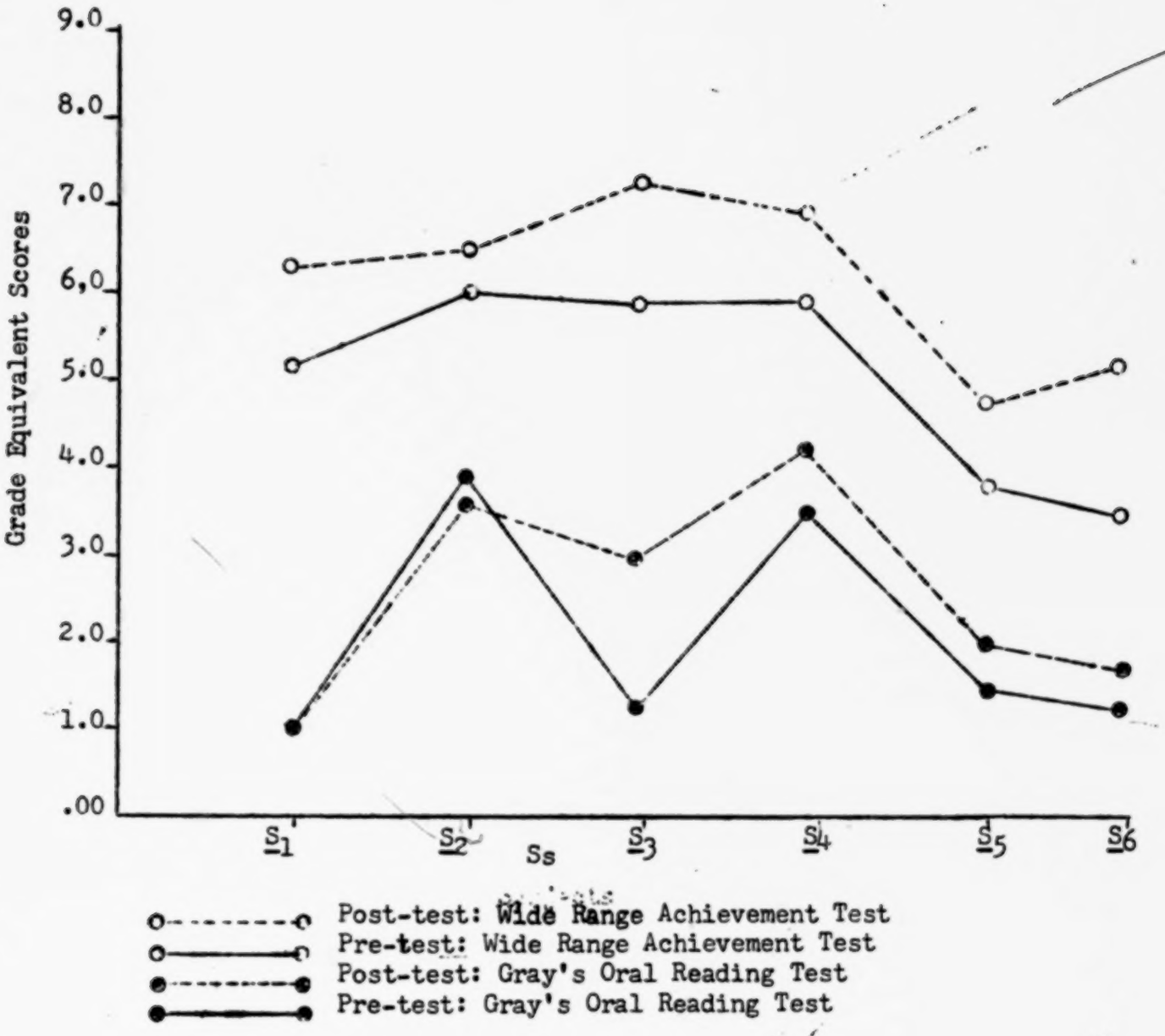
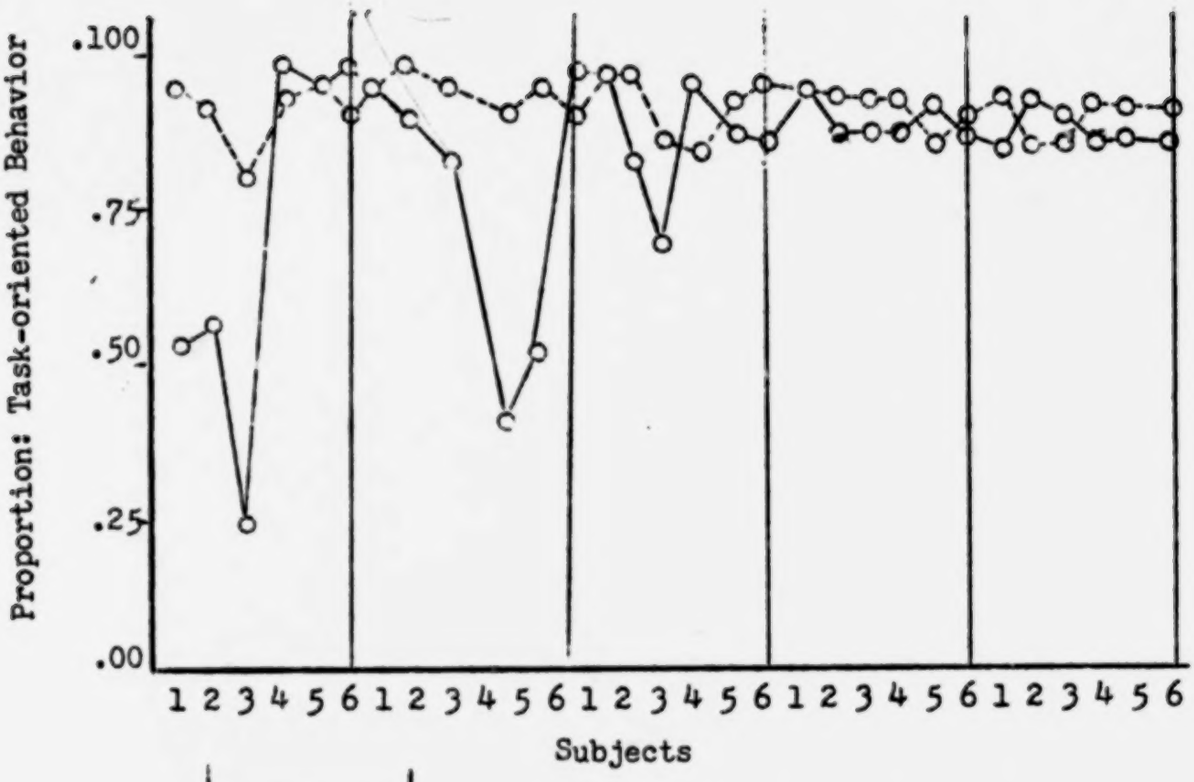


Figure 6

Experimental Group 1

Academic Gains During Treatment as Measured by the Wide Range Achievement Test and the Gray's Oral Reading Test



1 2 3 4 5 6 = a time bloc of one week

○——○ = average performance for an S on the variable of task-oriented behavior for a one week bloc. in the regular classroom.

○- - - - -○ = Average performance for an S on the variable of task-oriented behavior for the same-one week period in the experimental classroom.

Figure 7

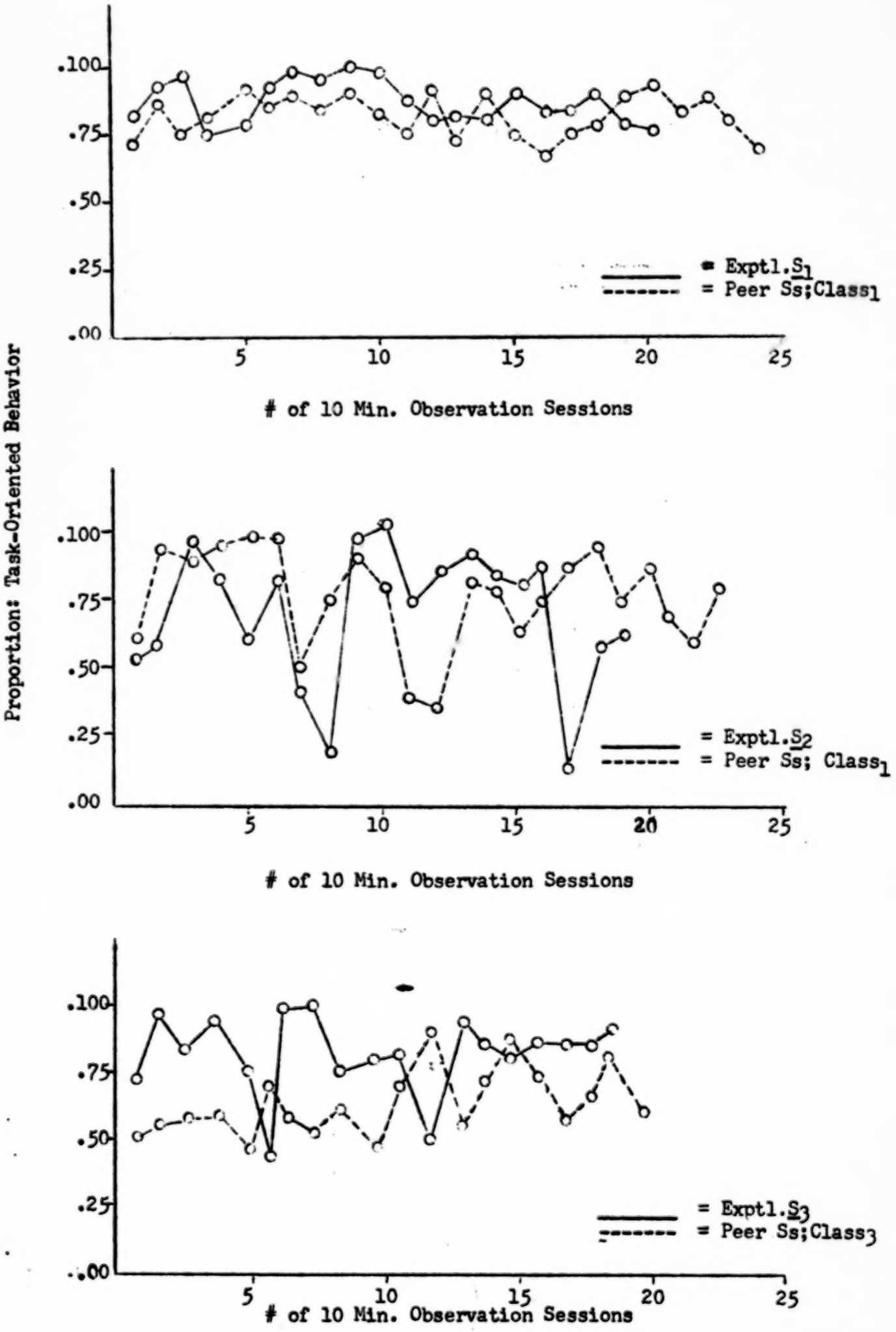
Experimental Group 1

Stimulus Generalization on the Variable of Task-oriented Behavior Between Treatment and Non-Treatment Settings

Figure 8

Experimental Group 1

Post-Treatment Comparisons of Deviant Subjects with Their Respective Peer Group Subjects on the Variable of Task-Oriented Behavior


Proportion: Task-Oriented Behavior
.100
.75
.50
.25
.00
5
10
15
20
25
of 10 Min. Observation Sessions
= Exptl. S1
= Peer Ss; Class1
= Exptl. S2
= Peer Ss; Class1
= Exptl. S3
= Peer Ss; Class3

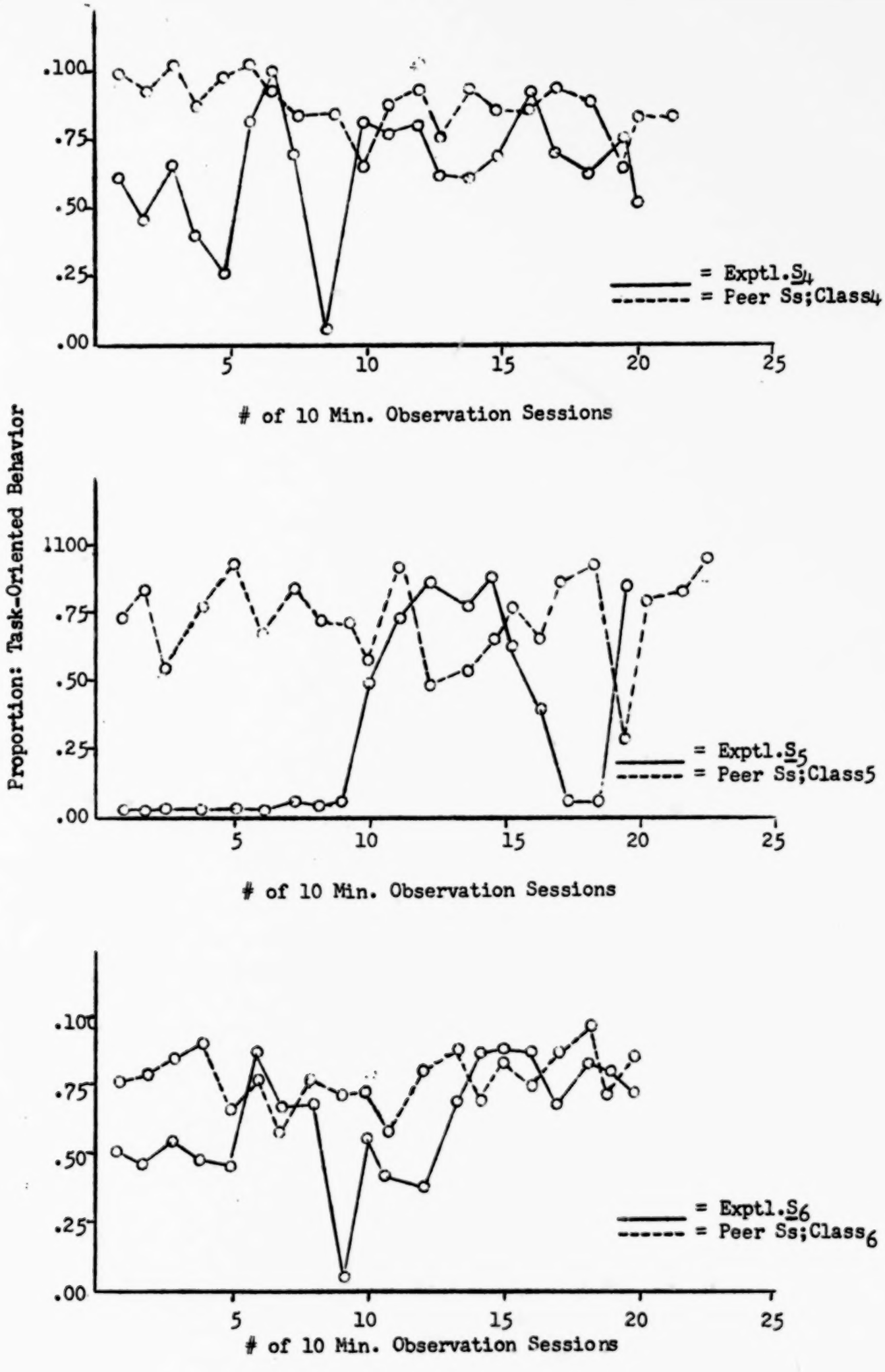
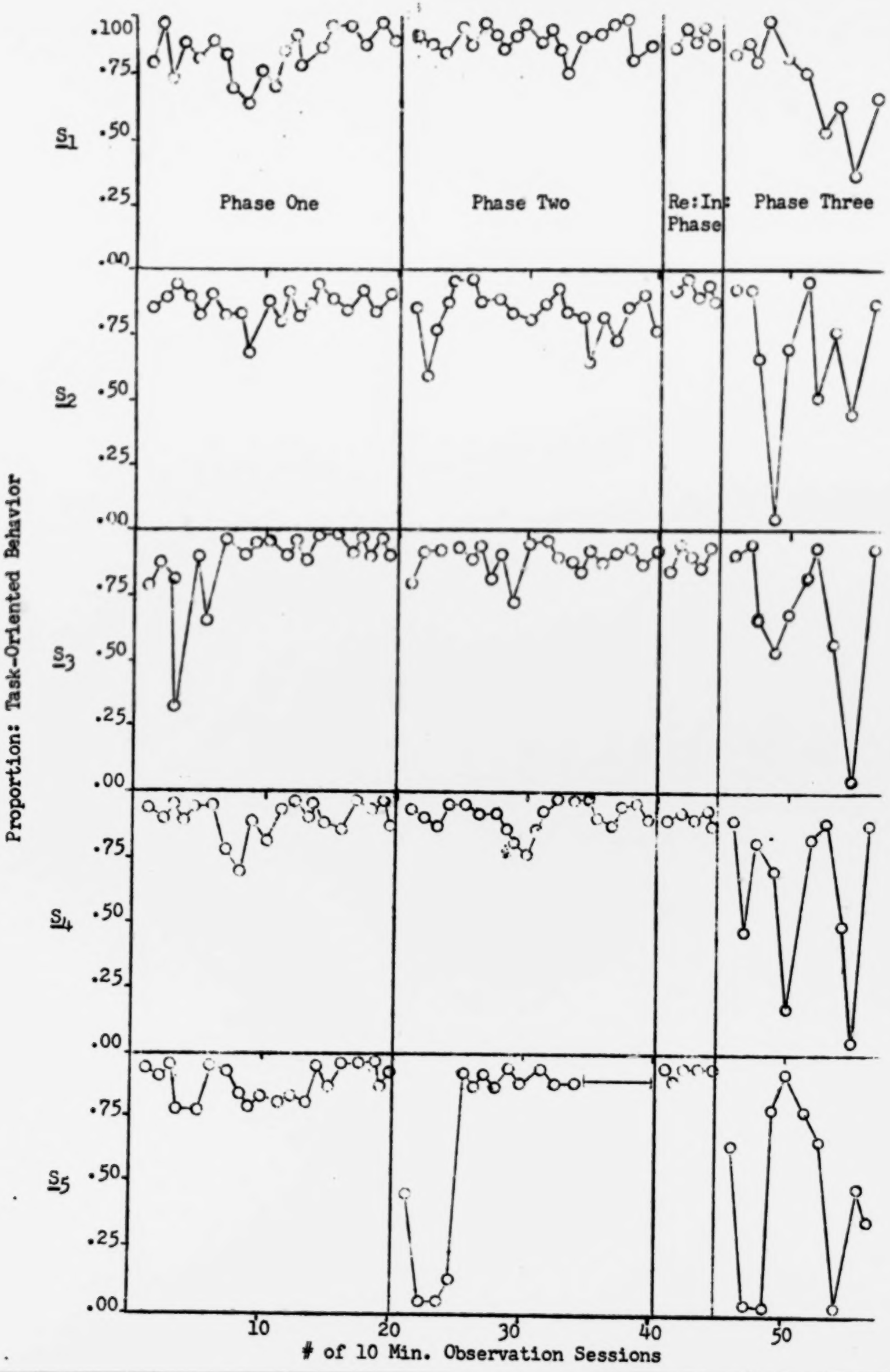
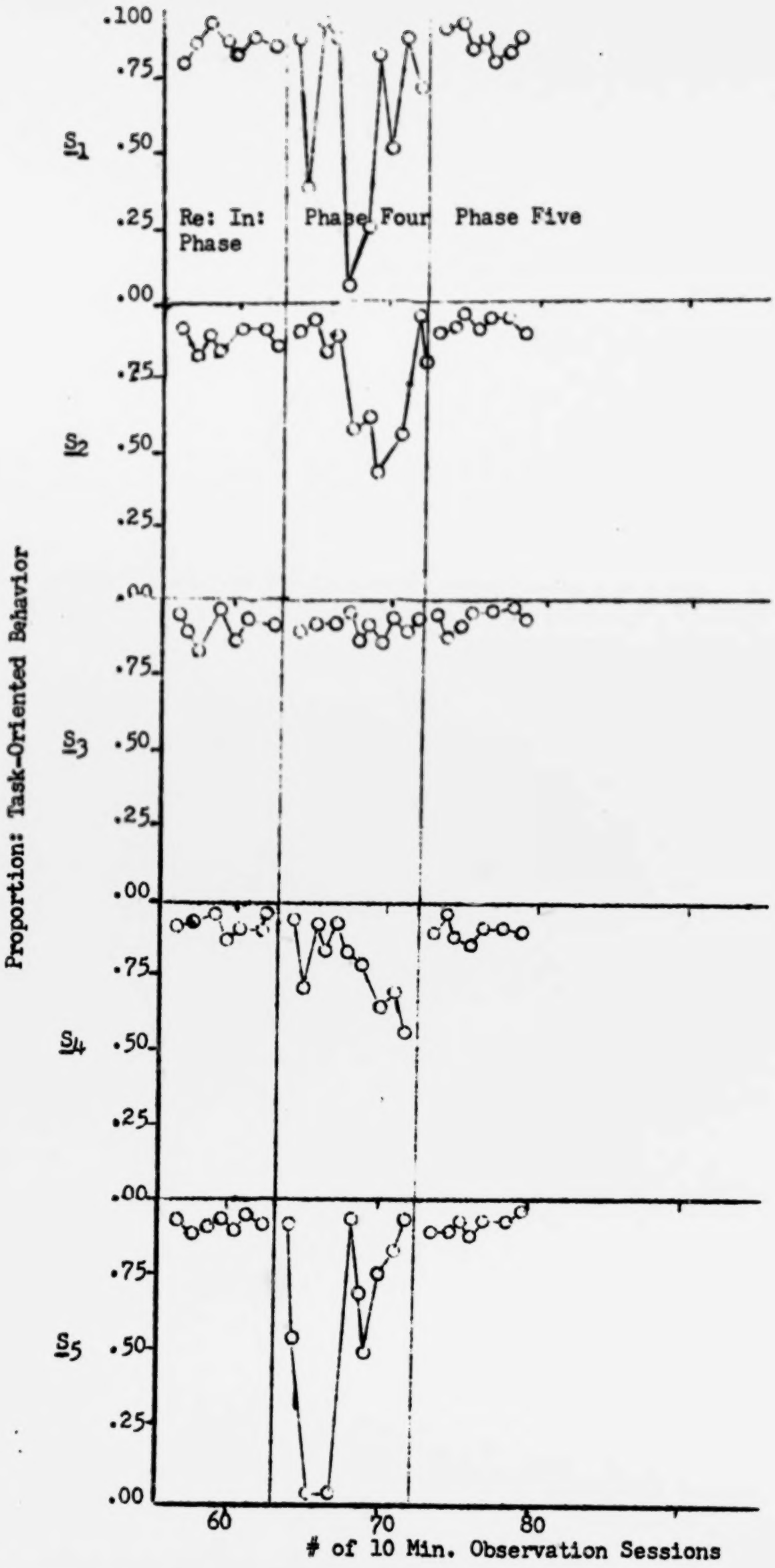

Proportion: Task-Oriented Behavior
.100
.75
.50
.25
.00
5
10
15
20
25
of 10 Min. Observation Sessions
= Exptl. S4
= Peer Ss; Class4
= Exptl. S5
= Peer Ss; Class5
= Exptl. S6
= Peer Ss; Class6

Figure 9

Experimental Group 2

Experimental Analysis of the Effects
of Three Treatment Variables
Upon the Task-Oriented Be-
havior of Deviant Subjects
in Grades 4, 5, & 6


Proportion: Task-Oriented Behavior
.100
.75
.50
.25
.00
S1
S2
S3
S4
S5
Phase One
Phase Two
Re:In: Phase
Phase Three
10
20
30
40
50
of 10 Min. Observation Sessions


Proportion: Task-Oriented Behavior
.100
.75
.50
.25
.00
S1
Re: In: Phase
Phase Four
Phase Five
S2
S3
S4
S5
60
70
80
of 10 Min. Observation Sessions